WHAT IS CLAIMED IS:

1. An apparatus for enhancing image quality of a previously coded digital video signal in a digital video system, said apparatus comprising:

a usefulness metric generator within said digital video system capable of generating a usefulness metric to determine an amount of video enhancement that can be applied to said previously coded digital video signal without enhancing coding artifacts.

2. The apparatus as claimed in Claim 1 wherein said digital video system comprises at least one sharpness enhancement unit that is capable of applying a sharpness enhancement algorithm to said previously coded digital video signal, and wherein said apparatus further comprises:

a coding gain control block capable of using said usefulness metric to determine an allowable amount of sharpness enhancement applied to said previously coded digital video signal by said at least one sharpness enhancement unit.

3. The apparatus as claimed in Claim 2 wherein said at least one sharpness enhancement unit is an adaptive peaking unit.

4. The apparatus as claimed in Claim 3 wherein said usefulness metric calculates on a pixel by pixel basis how much a pixel can be enhanced without increasing coding artifacts.

5. The apparatus as claimed in Claim 4 wherein coding gain of a pixel is determined by the equation:

$$g_{coding}(i,j) = UME(i,j) + g_{edge}(i,j)$$

and wherein i and j are pixel coordinates, g_{coding} is a pixel coding gain, UME is a usefulness metric, and g_{edge} is based upon edge related information derived from an image.

6. The apparatus as claimed in Claim 5 wherein a value for g_{edge} (i,j) is calculated by setting the value of g_{edge} (i,j) equal to (1) an experimentally determined value c for an edge pixel p (i,j) at a spatial location (i, j), and to (2) a value of one half of c for a pixel p(i - 1, j) at a spatial location (i - 1, j) and for a pixel p (i + 1, j) at a spatial location (i + 1, j), and to (3) a value of one fourth of c for a pixel p(i - 2, j) at a spatial location (i - 2, j) and for a pixel p (i + 2, j) at a spatial location (i + 2, j), and to (4) a value of zero for all other pixels.

7. The apparatus as claimed in Claim 1 wherein said usefulness metric generator utilizes only coding information to generate said usefulness metric.

8. The apparatus as claimed in Claim 1 wherein said usefulness metric generator utilizes coding information and scene content related information to generate said usefulness metric.

9. A digital video system comprising an apparatus for enhancing image quality of a previously coded digital video signal in said digital video system, said apparatus comprising:

a usefulness metric generator within said digital video system capable of generating a usefulness metric to determine an amount of video image enhancement that can be applied to said previously coded digital video signal without enhancing coding artifacts.

10. The digital video system as claimed in Claim 9 wherein said digital video system comprises at least one sharpness enhancement unit that is capable of applying a sharpness enhancement algorithm to said previously coded digital video signal, and wherein said apparatus further comprises:

a coding gain control block capable of using said usefulness metric to determine an allowable amount of sharpness enhancement applied to said previously coded digital video signal by said at least one sharpness enhancement unit.

11. The digital video system as claimed in Claim 10 wherein said at least one sharpness enhancement unit is an adaptive peaking unit.

12. The digital video system as claimed in Claim 11 wherein said usefulness metric calculates on a pixel by pixel basis how much a pixel can be enhanced without increasing coding artifacts.

13. The digital video system as claimed in claim 12 wherein coding gain of a pixel is determined by the equation:

$$g_{coding}(i,j) = UME(i,j) + g_{edge}(i,j)$$

and wherein i and j are pixel coordinates, g_{coding} is a pixel coding gain, UME is a usefulness metric, and g_{edge} is based upon edge related information derived from an image.

14. The digital video system as claimed in Claim 13 wherein a value for g_{edge} (i,j) is calculated by setting the value of g_{edge} (i,j) equal to (1) an experimentally determined value c for an edge pixel p (i,j) at a spatial location (i, j), and to (2) a value of one half of c for a pixel p(i - 1, j) at a spatial location (i - 1, j) and for a pixel p (i + 1, j) at a spatial location (i + 1, j), and to (3) a value of one fourth of c for a pixel p(i - 2, j) at a spatial location (i - 2, j) and for a pixel p (i + 2, j) at a spatial location (i + 2, j), and to (4) a value of zero for all other pixels.

15. The digital video system as claimed in Claim 9 wherein said usefulness metric generator utilizes only coding information to generate said usefulness metric.

16. The digital video system as claimed in Claim 9 wherein said usefulness metric generator utilizes coding information and scene content related information to generate said usefulness metric.

17. A method for enhancing image quality of a previously coded digital video signal in a digital video system, said method comprising the steps of:

generating a usefulness metric in a usefulness metric generator in said digital video system; and

utilizing said usefulness metric to determine an amount of video image enhancement that can be applied to said previously coded digital video signal without enhancing artifacts.

18. The method as claimed in Claim 17 wherein said digital video system comprises at least one sharpness enhancement unit that is capable of applying a sharpness enhancement algorithm to said previously coded digital video signal, and wherein said method further comprises the step of:

utilizing said usefulness metric in a coding gain control block to determine an allowable amount of sharpness enhancement applied to said previously coded digital video signal by said at least one sharpness enhancement unit.

19. The method as claimed in Claim 18 wherein said at least one sharpness enhancement unit is an adaptive peaking unit.

20. The method as claimed in Claim 19 wherein said usefulness metric calculates on a pixel by pixel basis how much a pixel can be enhanced without increasing coding artifacts.

21. The method as claimed in Claim 20 wherein coding gain of a pixel is determined by the equation:

$$g_{coding}(i,j) = UME(i,j) + g_{edge}(i,j)$$

and wherein i and j are pixel coordinates, g_{coding} is a pixel coding gain, UME is a usefulness metric, and g_{edge} is based upon edge related information derived from an image.

22. The method as claimed in Claim 21 wherein a value for g_{edge} (i,j) is calculated by setting the value of g_{edge} (i,j) equal to (1) an experimentally determined value c for an edge pixel p (i,j) at a spatial location (i, j), and to (2) a value of one half of c for a pixel p(i - 1, j) at a spatial location (i - 1, j) and for a pixel p (i + 1, j) at a spatial location (i + 1, j), and to (3) a value of one fourth of c for a pixel p(i - 2, j) at a spatial location (i - 2, j) and for a pixel p (i + 2, j) at a spatial location (i + 2, j), and to (4) a value of zero for all other pixels.

23. The method as claimed in Claim 17 comprising the step of:

utilizing only coding information to generate said usefulness metric in said usefulness metric generator.

24. The method as claimed in Claim 17 comprising the step of: utilizing coding information and scene content related information to generate said usefulness metric in said usefulness metric generator.